

American Society for Testing Materials

BULLETIN

ISSUED



BI MONTHLY

A Review of 1928

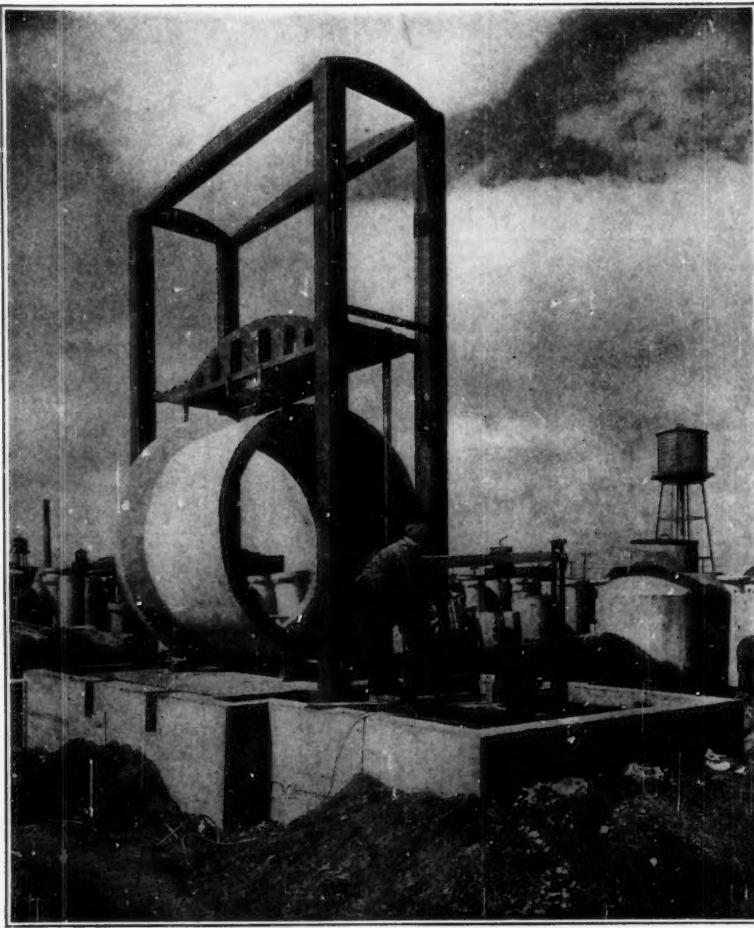
OUR ANNUAL REVIEW of the Society's activities during the past year is presented herewith. The purpose of this review is not only to present a general prospective of the work of the Society and its committees during the year, thus indicating how far it has progressed in carrying out the projects before it, but also to give some indication of what may be expected in the years ahead. The year just ended has been one of strengthening and extension, and to that extent continued progress and accomplishment will be expected by the readers of future reviews.

January, 1929

ENGINEERS' CLUB BUILDING
1315 SPRUCE ST., PHILADELPHIA

OLSEN

TESTING AND BALANCING MACHINES



AS USED BY

Massey Concrete Products Company of Chicago, Illinois

THE largest Universal Testing Machine in the world especially adapted to drain tile testing.

Constructed on Olsen standard four-screw rotating gear nut principle of gearing, which we consider the strongest, stiffest and most durable type of construction in a testing machine. This provides a direct, straight pull on the crosshead, eliminating all bending and twisting moments on the screws, with all rotating parts below the base cover.

In this machine the new Olsen Patent Multiple Lever System is used which is especially adapted for use in connection with the construction of such large machines.

Testing Machines of this design may be obtained in any capacity, for either tension or compression testing, up to 2,000,000 pounds capacity, and of size to meet specifications.

TINIUS OLSEN TESTING MACHINE COMPANY

500 No. 12th Street, Philadelphia, Pa.

American Society for Testing Materials



BULLETIN

ENGINEERS' CLUB BUILDING

1315 SPRUCE STREET

PHILADELPHIA, PA.

NUMBER 36

January 30, 1929

1928 in the A.S.T.M.

THE work of the American Society for Testing Materials during 1928 was characterized by a strengthening and broadening of the Society's activities and facilities. From the time of its incorporation in 1902 the Society has continued to grow in membership and in effectiveness. Year by year the number of its standards has increased to the present total of 548. But with the increased service that the Society is rendering in the disseminating of information on the properties of engineering materials and in the preparation of purchase specifications and standard methods of test, increased demands are constantly being made on the facilities of the Society and the necessary expansion must be provided for. The past year has shown much progress in such expansion and strengthening, so the Society may look forward with confidence in carrying on present and future programs of usefulness.

Much of this strengthening is a direct result of the increased income of which the Society is assured through the voluntary increase in dues of company members. The larger income has made possible during the past year the acceptance of an increased number of technical papers presenting the results of valuable investigations in the properties of materials, and the publication of more extensive committee reports.

A new publication was established in the Index to A.S.T.M. Standards and Tentative Standards which not only serves the members but carries the work of the Society more effectively to other users of A.S.T.M. standards. The publication of the standards themselves is receiving greater attention, partly due to the addition of a technical assistant to the office staff.

By way of organization, additional committees are being formed to take up important research investigations, a notable addition in this field being the new Research Committee on Fatigue Phenomena in Metals.

A new Committee on Iron-Chromium-Nickel Alloys is being organized, which committee will extend the present information on the corrosion-resistance and other properties of these alloys. The work on non-ferrous metals has increased so tremendously since the organization of the Society's Committee B-2 in 1909 that several phases of the work previously handled by this committee have now been assigned to new committees on: Copper and Copper Alloys, Cast and Wrought; Alloys of Tin, Lead, Zinc and Antimony; and Light Metals and Alloys, Cast and Wrought. The scope of Committee B-4 on Metallic Materials for Electrical Heating has likewise been increased to include all resistance wires,

the new title of the committee being "High-Temperature and Electrical-Resistance Alloys." With this realignment in committee organization a coordinating committee on non-ferrous metals is being organized to serve as a steering committee to the several standing committees dealing with subjects in the non-ferrous metals field and a similar coordinating committee has been organized to coordinate the activities of Committee A-5 on Corrosion of Iron and Steel, Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys and Committee A-10 on Iron-Chromium-Nickel Alloys.

The cooperative activities of the Society, long a feature of A.S.T.M. work, have likewise been extended during the year, an outstanding example being the Society's relation with the American Standards Association (formerly the American Engineering Standards Committee). Five of the A.S.T.M. standing committees have now been organized as sectional committees functioning under the rules of procedure of the A.S.A. with the Society acting as sponsor, bringing in representatives from other organizations, thus broadening the personnel of the committees as A.S.T.M. committees. In addition many of the standing committees are officially represented on sectional committees for which the Society is sponsor or joint sponsor and the Society is also represented on many sectional committees having other than A.S.T.M. sponsorship. These sectional committees have been quite active during the year, resulting in many instances in the submission of standards or tentative standards which have been formally approved by the A.S.A.

Similarly, the joint committees, such as the Joint Concrete Culvert Pipe Committee, have been quite active in the preparation of specifications, or in carrying out research projects, such as the Joint Research Committee on Effect of Temperature on the Properties of Metals and the Joint Committee on the Investigation of the Effect of Phosphorus and Sulfur in Steel. The importance of cooperation has been recognized throughout, resulting at least in one instance, the Commercial Standards Unit of the U.S. Bureau of Standards, in the organization of a special contact committee of the Executive Committee. The results of these cooperative relations will be evident in the detailed account of the Society's activities which follows.

Corrosion, Corrosion-Fatigue, Fatigue

The subject of corrosion continues to receive considerable attention, as its importance warrants. The Society's Com-

mittee A-5 on Corrosion of Iron and Steel presented a final report on the atmospheric exposure tests of copper-bearing and non-copper bearing black sheets located at Fort Sheridan, Ill. In presenting this report, final results on the sheets located at Pittsburgh, presented in 1923, were repeated. The tests at Annapolis are still in progress. The committee is continuing its investigations on service tests of galvanized material. The galvanized sheets exposed to the atmosphere at Pittsburgh, Altoona, State College, Sandy Hook and Key West have been inspected twice and interesting data on weathering have been reported. Within the year the collection of galvanized wire and fencing, hardware, pipe, conduit and structural shapes in various coatings such as hot-dipped galvanizing, sherardizing, electro-zinc plating and cadmium plating has been completed and the specimens are now being installed on the racks at the five test locations.

The Sub-Committee on Metal Culvert Corrosion Tests has established satisfactory working relations regarding its proposed work with the Highway Research Board and a number of state organizations working with culverts. The study of existing data and inspection of some of the present culvert installations are contemplated. Specifications were submitted during the year on zinc-coated (galvanized) barb wire and on zinc-coated (galvanized) steel wire strand. Substantial progress has been made in the study of zinc-coated (galvanized) guy and messenger strand wire for telephone, telegraph and signal use, road guard cable and road guard fabric, and it is expected that specifications for these products will be included in the next annual report of the committee.

The Sectional Committee on Zinc Coating of Iron and Steel prepared specifications for zinc (hot-galvanized) coatings on structural steel shapes, plates and bars and their products and proposed specifications for the zinc coating on iron and steel sheets which were accepted for publication by the Society at the 1928 annual meeting. In addition it submitted for publication as information proposed specifications for zinc coatings (galvanizing) on pipe and fittings.

Committee A-1 on Steel, recognizing the value for certain purposes of copper-bearing steel, submitted proposed revisions of the Society's standard specifications for structural steel for bridges, for structural nickel steel and for structural steel for buildings, permitting the use of copper-bearing steel and specifying a minimum percentage of copper when copper-bearing steel is ordered.

Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys has laid out a very extensive program, paralleling that of Committee A-5, whereby various non-ferrous metals would be exposed to the atmosphere using the same test racks as Committee A-5. Its campaign for funds for carrying out this investigation has been brought to a successful conclusion with the raising of close to \$8000. The necessary specimens are now on order. The Bureau of Standards will act as "store-keeper" and will take care of the distribution of the specimens. The effects of combined corrosion and fatigue have been further reported upon in a paper by D. J. McAdam, Jr., on "Some Factors Involved in Corrosion and Corrosion-Fatigue of Metals," and one by F. N. Speller, I. B. McCorkle and P. F. Mumma on "Influence of Corrosion Accelerators and Inhibitors on Fatigue of Ferrous Metals."

Aside from the two papers already mentioned which discuss fatigue of metals a further paper was presented by J. B. Kimmers on "The Static and Fatigue Properties of Some Cast Irons." The subject of fatigue is one of exceptional importance and has received the attention of individual inves-

tigators for a number of years. A research committee of the Society, as previously mentioned, has now been organized to study the subject intensively. It will summarize and correlate the work that various laboratories are doing, and will study the relationship between fatigue failure and other strength properties of metals and their atomic and metallographic structures. As a first step it has laid plans for the preparation of abstracts of papers and reports on fatigue of metals of major significance published throughout the world.

Magnetic Analysis and Testing

A new method of magnetic analysis was described in a paper presented before the Society by W. B. Kouwenhoven and Julian D. Tebo entitled "The Incremental Permeability Method for the Magnetic Analysis of High-Speed Steel." A paper by Haakon Styri on "Endurance of High-Speed Cut-Off Tools in Relation to Magnetic and Other Measurements" presented some further results of tests on high-speed drills, part of an investigation started several years ago. These investigations were undertaken under the auspices of Committee A-8 on Magnetic Analysis. Fitting recognition of a painstaking investigation in this field, carried out by one of the committee members, was made in the 1928 award of the Charles B. Dudley Medal to A. V. de Forest for his paper presented at the 1927 annual meeting on "A Method of Graphic Representation of Magnetic Characteristics."

Committee A-6 on Magnetic Properties revised its standard methods of test for magnetic properties of iron and steel through the incorporation of methods for low inductions at 1000 cycles. Methods for magnetic testing under high magnetizing forces are being studied with a view to the preparation of specific requirements for this type of testing. The use of high magnetizing forces is becoming of increasing importance for the testing of cobalt magnet steels. The work of the subcommittee on nomenclature and definitions has been continued through the submission of a proposed list of terms, definitions and symbols which are now receiving the consideration of the Society's Committee E-8 on Nomenclature and Definitions.

Iron and Steel, General

In addition to the activities of Committee A-1 on Steel already referred to, mention should be made of the committee's revisions of the specifications for carbon-steel and alloy-steel forgings, particularly as to heat treatment requirements, permitting the furnishing of higher grade treatments to material within the scope of these specifications. Revisions of the concrete reinforcement bar specifications were proposed, changing the strength requirements for certain grades. A method of sampling for check analysis was proposed to bring the methods of sampling in line with modern methods of laboratory practice. New specifications for electric cast-steel anchor chain were submitted replacing the former tentative specifications in order that the specifications will cover modern requirements. The specifications for carbon-steel castings for valves, flanges and fittings, and for lap-welded and seamless steel pipe, both for high-temperature service, were reviewed and substantially revised. The program of the committee for the coming year includes research and development work which will be of particular interest to the industry and of value to both producers and consumers.

In addition to submitting new specifications for iron and steel chain and offering a revision of the present standard specifications for staybolt, engine-bolt and extra-refined wrought-iron bars, Committee A-2 on Wrought Iron has been engaged in an exhaustive study of what constitutes quality in wrought iron. The committee is also investigating the effect of phosphorus on staybolt iron. Process clauses in the various wrought-iron specifications are also being reviewed.

Mention has already been made of a paper by J. B. Kimmers on fatigue of cast iron, presented under the auspices of Committee A-3 on Cast Iron. A further discussion on the

(Continued on page 6)

Schedule of Committee Meetings

DATE	COMMITTEE	PLACE
January 31....	D-9 on Electrical Insulating Materials.....	New York City
February 19....	Committee A-10 on Iron-Chromium-Nickel Alloys.....	New York City
February 19....	Committee B-5 on Copper and Copper Alloys.....	New York City
February 19....	Section Committee E-1, on Bend Tests.....	New York City
February 20....	Committee B-3 on Corrosion of Non-Ferrous Metals.....	New York City
February 21....	Sub-Committee XV, B-2, on Die-Cast Metals and Alloys.....	New York City
February.....	C 8 on Refractories.....	Chicago
March 6.....	D-7 on Timber.....	Chicago
March 19-22.	GROUP COMMITTEE MEETING.....	Chicago
March 28.....	D-1 on Preservative Coatings.....	Philadelphia
March.....	D-13 on Textile Materials.....	Boston
April.....	C-3 on Brick.....	

Spring Group Committee Meeting in Chicago

The annual Spring Group Committee Meeting will be held in Chicago at The Stevens over the dates March 19 to 22. Chicago was selected as the place for the meeting after consulting with the standing committees involved. The holding of one of these group meetings in the Middle West is in line with the general policy of carrying the work of the Society to the several sections of the country. It is particularly appropriate that the Middle West should have been selected at this time in view of the fact that the last two group meetings were held in the East, Philadelphia in 1926 and Washington in 1927, and with the 1928 and 1929 annual meetings in Atlantic City.

Present indications promise a very successful meeting with many committees participating.

1928 Proceedings

The Proceedings of the 1928 annual meeting are off press and are now being distributed. The two volumes, Part I containing committee reports and tentative standards, and Part II containing technical papers, comprise 2088 pages.

Especial attention is called to the many discussions appearing in Part II, particularly since the discussion is in far greater volume than in other years. While most of the reports and papers were preprinted in advance of the annual meeting so that members have had an opportunity to receive these in separate pamphlet form, the discussions were not printed before their publication in the Proceedings. Members will find this discussion of considerable value.

Jesse L. Jones

The Society lost through death an esteemed member and a valued committee worker in Jesse L. Jones, who died on January 21, 1929. For many years Mr. Jones had been associated with the Westinghouse Electric and Manufacturing Co. in the capacity of Chief Chemist and had represented that company on many of the Society's committees and sub-committees. Mr. Jones served on Committee B-2 on Non-Ferrous Metals and Alloys and on many of its sub-committees. He also served on Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys and on Committee A-5 on Corrosion of Iron and Steel.

Mr. Jones was formerly head of the Testing Department of Cramps Ship Building Co. in Philadelphia and was at one time Assistant State Chemist of Ohio. He had been awarded the Joseph S. Seaman Medal by the American Foundrymen's Association a few days before his death.

A New Code for Business

"Unnecessary sales and purchasing expense is an economic waste, a tax on legitimate industry. Its elimination will assure satisfactory profits to the producer, economy to the consumer, and greater efficiency in commercial relations." With this preamble, The National Association of Purchasing Agents introduces its proposed standards for buying and selling as a code of ethics in business. Our Society, of course, subscribes with the sentiments expressed in this preamble, since much of its work in the preparation of standard specifications is with a view towards bringing about better understanding between the manufacturer and purchaser and to effect economies in industry. Believing the principles to be of more than passing interest, the ten standards of the code are reproduced below:

First.—To buy and sell on the basis of *value*, recognizing that value represents that combination of quality, service, and price which assures greatest ultimate economy to the user.

Second.—To respect our obligations and neither expressly nor impliedly to promise a performance which we cannot reasonably expect to fulfill.

Third.—To avoid misrepresentation and sharp practice in our purchases and sales, recognizing that permanent business relations can be maintained only on a structure of honesty and fair dealing.

Fourth.—To be courteous and considerate to those with whom we deal, to be prompt and businesslike in our appointments, and to carry on negotiations with all reasonable expedition.

Fifth.—To avoid statements tending to injure or discredit a legitimate competitor, and to divulge no information acquired in confidence with the intent of giving or receiving an unfair advantage in a competitive business transaction.

Sixth.—To strive for simplification and standardization within the bounds of utility and industrial economy, and to further the development of products and methods which will improve industrial efficiency.

Seventh.—To recognize that character is the greatest asset in commerce, and to give it major consideration in the selection of customers and sources of supply.

Eighth.—To adjust claims and settle disputes on the basis of facts and fairness, to submit the facts to arbitration if a mutual agreement cannot be reached.

Ninth.—To provide or accept no gifts or entertainment in the guise of sales expense, where the intent or effect is to unduly prejudice the recipient in favor of the donor as against legitimate competitors.

Tenth.—To give or receive no bribes, in the form of money or otherwise, in any commercial transaction, and to expose commercial bribery wherever encountered for the purpose of maintaining the highest standard of ethics in American industry.

The sixth item, referring as it does to standardization, ties in most intimately with the work of the Society. As an aid in bringing the standards of the A.S.T.M. to the attention of purchasing agents, a general distribution has been made of the Society's Index to A.S.T.M. Standards and Tentative Standards among the members of The National Association of Purchasing Agents. Their interest in this subject is apparent in that one thousand of those to whom the Index has gone have already indicated their desire to secure all future issues of the Index.

Symposium on Corrosion

An all-day Symposium on Corrosion under the general auspices of the Institute of Metals Division will be held in connection with the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York City at the Engineering Societies' Building. The symposium will take place on Thursday, February 21. Members of the A.S.T.M. are cordially invited to attend.

AMERICAN SOCIETY FOR TESTING MATERIALS
BULLETIN

Issued Bi-Monthly

Engineers' Club Building, 1315 Spruce St., Philadelphia, Pa.

President
G. W. THOMPSON

Vice-Presidents

T. D. LYNCH

K. G. MACKENZIE

Secretary-Treasurer
C. L. WARWICK

Members of Executive Committee

F. O. CLEMENTS
W. H. KLEIN
F. C. LANGENBERG
T. R. LAWSON

H. S. MATTIMORE
P. D. MERICA
F. N. SPELLER
S. T. WAGNER

W. H. FULWEILER

Past-Presidents
J. H. GIBBONEY

H. F. MOORE

Assistant Treasurer
J. K. RITTENHOUSE

Assistant Secretary
R. E. HESS

Number 36

January 30, 1929

An Auspicious Year

AGAIN the BULLETIN brings to the members a review of Society activities during the year just ended—a record of accomplishments in which the members may justly take pride. We have felt that these annual reviews are fulfilling the very useful purpose of giving a "panoramic view" of A.S.T.M. work, of especial value to those who may wish to keep in general touch with Society affairs, although interested specifically in the activities of only certain committees whose annual reports give them the desired detailed information.

In the December BULLETIN we referred to "assets" and "liabilities" of an abstract nature, the assets being an interested Society membership, a committee organization working assiduously to advance the purposes for which the Society is organized, and the "goodwill" of industry and technology evidenced in many ways; the liabilities being the obligations of the Society to its members, and in a broad sense to the public at large, to promote knowledge of materials and the standardizing of specifications and tests. To this we would now add facts less abstract in character—of the Society's finances during 1928. In round numbers, the receipts for the year from dues and entrance fees were \$83,000, from sales of publications \$29,900 and from miscellaneous sources \$9400, totalling \$122,300. Of this approximately \$15,000 represents net increased income from dues of company members. Disbursements, with all bills paid, totaled \$114,350, including the investment of \$1380 for the A.S.T.M. Research Fund, leaving a surplus of approximately \$8000—made possible of course by the increased income. This surplus has been utilized as follows: \$4000 has been put aside as a reserve Headquarters Fund towards expenses incident to possible removal of headquarters; \$2000 has been reserved as a Publication Fund from which to meet the cost of special or extraordinary publications that cannot be met from current funds; \$1500 has been added to the A.S.T.M. Research Fund and \$500 to the general reserve. The remaining \$7000 of increased income was spent as follows: \$1000 for reserve for 1930 Book of Standards, \$1000 for current Proceedings,

\$1400 for the new Index to Standards and Tentative Standards, \$3000 for salaries of technical assistant and clerical services on standardization work, and the remainder for miscellaneous expenses. Expressed in another way, the increased income for the first year of operation under \$30 company members has been used one-third for publications, one-fourth for headquarters reserve, one-tenth for research fund and one-fifth in building up the technical staff to enable it to handle efficiently the increasing standardization work of the Society—policies that we believe will meet with the approval of the members as a fulfillment of the promises implied in the request of the Executive Committee for increased income from membership dues.

In this way, through its stronger financial condition, the Society has been enabled to keep pace with the demands made upon it for increased service and it is now prepared to take even greater strides in the years ahead.

1929 Annual Meeting at Atlantic City

The members have no doubt noted on their calendars the dates for the 1929 annual meeting which, as announced in the December BULLETIN, are June 24 to 28. The meeting will be held at the Chalfonte-Haddon Hall, Atlantic City, where we have held such successful meetings in the past.

The next issue of the BULLETIN, which will appear early in March, will contain an announcement of hotel rates and details of plans for facilitating the making of reservations and the registration of our members.

The Provisional Program of the meeting will, as in the past, be sent to the members about the end of April. An interesting program is again promised in view of the many offers of papers that have already been received.

Nominating Committee for Officers

The letter ballot on recommendations for appointments on the Nominating Committee for Officers was canvassed by a committee of tellers appointed by the President, consisting of Messrs. F. G. Tatnall and C. C. Roberts. The report of the tellers to the Executive Committee showed that 808 legal ballots had been cast, of which one member received 51; one 49; two 18; one 13; three 12; one 11; one 10; four 9; two 8; four 7; six 6; eight 5; and the remainder 4 votes or less.

The Executive Committee has accordingly made the following appointments on the Nominating Committee in conformity with the indications of this vote:

Members
E. D. Boyer
J. Shuman
G. H. Clamer
R. W. Crum
M. E. McDonnell
R. L. Hallett

Alternates
J. C. Pearson
A. A. Stevenson
W. M. Corse
Prévost Hubbard
H. W. Faus
C. S. Trewin

Ex-Officio
W. H. Fulweiler J. H. Gibboney H. F. Moore

The Nominating Committee will meet on March 1 and make nominations for President, one Vice-President and four Members of Executive Committee to succeed those whose terms of office expire at the coming annual meeting.

International Congress Papers

Announcement has previously been made of the publication of the papers presented at the International Congress for Testing Materials held in Amsterdam in September, 1927, in the form of Congress Proceedings. A prospectus of these Proceedings accompanies this BULLETIN.

Society's Standardization Procedure

At its recent quarterly meeting, the Executive Committee received a report from one of its committees, consisting of Vice-President T. D. Lynch, chairman, T. R. Lawson, H. S. Mattimore and F. N. Speller, discussing certain broad phases of the Society's standardization work from two viewpoints: first, the handling of administrative matters relating to our standardization work and, secondly, the possibility of accelerating in suitable ways the Society's procedure for development of standards. As to the first subject, the committee has suggested the desirability of the Executive Committee delegating certain administrative authority in the consideration of matters affecting the standardization activities of the Society, possibly through the formation of a new standing committee acting in an advisory capacity to the Executive Committee, in much the same way that Committees E-6 on Papers and Publications and E-9 on Correlation of Research now function as administrative committees in their respective fields. The many ramifications of the standardization movement, not only within the Society's constantly growing committee organization but more particularly in the important relationships that are being established with other bodies engaged in similar activities, seem to point to the importance of considering this or some equivalent method of organization.

With respect to the second matter, the committee has recommended the policy of expediting the formulation and promulgation of proposed A.S.T.M. standards without sacrifice of the fundamental principles embodied in the Society's by-laws and regulations to safeguard the establishment of A.S.T.M. standards. Specifically the committee has proposed a plan that would make possible quicker action on acceptance of proposed specifications or methods of test as A.S.T.M. tentative standard, once the standing committee has completed its required letter ballot on the proposed tentative standard. The plan as proposed in no way affects the steps now provided for fullest possible consideration of proposed standards in committee, nor would it modify the procedure by which the Society formally registers its approval by letter ballot of an A.S.T.M. standard; it seeks simply to bring proposed standards that have been completed by our standing committees more promptly before the Society membership as tentative standards.

The Executive Committee believes that these proposals merit further study and they have been referred to Committee E-5 on Standing Committees, this committee and the Executive Committee jointly being responsible for the revision of the regulations that define our standardization procedure. A further discussion of this important subject is scheduled for the April meeting of the Executive Committee.

Papers for 1929 Annual Meeting

Members are reminded of the invitation to submit offers of technical papers for presentation at the 1929 annual meeting. This invitation was extended to the members in a circular sent out January 2. All offers accompanied by a summary and received not later than February 23 will be considered by the Committee on Papers and Publications, but consideration of offers received after that date is entirely contingent upon the condition of the Provisional Program when the offer is received.

Developments of the West Coast Trip

A brief account appeared in the December BULLETIN of the visit of the Secretary-Treasurer to the three Pacific Coast States to discuss personally with our members ways and means of promoting the usefulness of the Society's work and of extending its activities on the West Coast. A more extensive report has since been prepared for the use of the Executive Committee which discusses briefly the many contacts which the Secretary made with the various organizations and gatherings of members and others interested in specifications and the study of engineering materials. The report also discusses in some detail the various West Coast industries and the relation that the A.S.T.M. activities have to these industries, and along what lines these activities should be extended.

Many suggestions were received from members as to how the A.S.T.M. work on the Coast might be advanced. On the basis of these and the Secretary's impressions of conditions on the West Coast a number of recommendations have been made which are now receiving the consideration of the Executive Committee. These include consideration of the possibility of having members on the West Coast serve on the standing committees of the Society and of their participation to a greater extent in the investigative work of the Society. The recommendation that corresponding members from the West Coast serve on the Committee on Papers and Publications has already been referred to in the December issue of the BULLETIN, as has also the appointment of local committees of Society members in the several West Coast districts for the broad purpose of promoting the usefulness and extending the influence of the Society in the entire West Coast district.

One thought is developed very forcibly from all considerations of extending Society activities on the West Coast and discussions of questions of policy, and that is the importance of considering Society work along broad national lines. While it is true that the manufacturing industries of the country are centered east of the Mississippi River, the use of engineering materials is country-wide and the Society of necessity must be thoroughly national in its scope and its activities must be conducted accordingly. While the present considerations are confined specifically to the West Coast district, many of the plans and policies suggested are applicable to the promotion of our work in other localities and may well be extended to these districts.

Index to Methods of Testing

Believing that it would be of considerable assistance in its work in the correlation of test methods and in the work of the several standing committees in preparing methods of testing, a general index to all of the methods of the Society has been prepared by Committee E-1 on Methods of Testing and has been issued in mimeographed form. This index makes more available the various methods of the Society that have been published and may be of some assistance when a new method of test is under discussion in locating allied methods of test which may serve as a guide in preparing the new method.

Although the index was prepared primarily for the use of the members of Committee E-1 and the officers of standing committees, other members may be interested in the index and copies will be furnished on request so long as the supply lasts.

1928 in the A.S.T.M.

(Continued from page 2)

engineering properties of cast iron is being planned for the next annual meeting of the Society. The committee serving in an advisory capacity to the Society's committee on Papers and Publications has selected the following subjects: Classification and General Properties of Cast Iron; Effect of Size of Section on Physical Properties; Heat Treatment of Cast Iron; High Strength Iron; Alloy Cast Iron; Impact Values of Cast Iron and Fatigue Values of Cast Iron.

In line with the recommendations of the committee during the past few years, new requirements for the arbitration test bar and tension test specimen were submitted to replace the present references to these specimens in the current standard specifications for cast iron.

As previously mentioned, a new Committee A-10 on Iron-Chromium-Nickel Alloys is being organized to promote knowledge of properties of the alloys in the iron-chromium-nickel system, and to develop such methods of test and ultimately such specifications as may be warranted by progress in the development and use of these alloys.

Non-Ferrous Metals

Committee B-2 on Non-Ferrous Metals and Alloys, organized in 1909 to have direct charge of all the Society's standardization work in the non-ferrous metals field, save that of copper wire which had been assigned to a separate standing committee, has seen its work grow with the rapid development of non-ferrous metals in recent years so that separate standing committees were deemed desirable to cover certain of its activities. Accordingly three new standing committees have been authorized. Committee B-5 on Copper and Copper Alloys, Cast and Wrought, Committee B-6 on Alloys of Tin, Lead, Zinc and Antimony, and Committee B-7 on Light Metals and Alloys, Cast and Wrought. Committee B-2 will continue to have jurisdiction over all other standardization work formerly in its charge together with the initiating and development of new projects. An idea of the magnitude and diversity of the standardization work handled by this committee may be gathered from its 1928 report in which five specifications relating to non-ferrous castings were advanced to standard, together with the specifications for brazing solder, bronze castings for locomotive wearing parts and car and tender journal bearings and the submission of new specifications for fire-refined copper other than lake, seamless copper tubes, sand castings of the alloy: copper 80 per cent; tin 10 per cent; lead 10 per cent, and for silver solders.

One investigation that has been carried on with especial vigor during the past year has been that on die-castings. The extent of the investigation may be appreciated when it is realized that 55,000 specimens have been prepared and distributed among the cooperating laboratories. The alloys under investigation are 23 in number and include both the aluminum-base and zinc-base alloys. The physical tests include tension, hardness and impact tests. Atmospheric exposure tests will also be carried out on these alloys in conjunction with Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys, and aging tests are being conducted.

The enlarged Committee B-4 on High-Temperature and Electrical-Resistance Alloys will study the various alloys with copper, nickel and manganese and other elements that are used in this field, confining its studies of the iron-chromium-nickel system to temperatures above 500° C. The membership is being enlarged to take care of the increase in scope and a study of electrical-resistance wires is being made. Tests have been made on nickel-chromium wire and ribbon showing that all sizes have the same specific resistance and density within narrow limits. Tests are being developed to determine the mechanical stability of electric heating materials under service conditions. Agreement has been reached on the dimensions of spools for electrical heater wires and standard colors for labels on spools for the various grades of electrical heater and resistance wires have been agreed upon.

A special committee has been organized to study and promote the use of specifications covering copper alloys in ingot form as the basis of price quotations in technical and trade journals. This committee will make a study of the many specifications for copper alloys, including those of producers, consumers and technical societies, in order that if possible the number of the specifications be reduced and to realize the full economic benefits that will accompany a reduction in the large number of compositions now called for. With the cooperation of the Non-Ferrous Ingot Metals Institute the committee has undertaken the preparation of a comparative abstract of the requirements of all available specifications.

Cement, Lime and Gypsum

Committee C-1 on Cement as a result of its work of last year, which was presented in a rather voluminous report to the Society at the last meeting, has concluded that intensive work must be done in developing a more satisfactory method for testing cement. The present methods do not permit of securing the concordance among laboratories that is needed. Furthermore, they do not indicate the true value of cement in a concrete. The committee, therefore, impressed with the results presented at the annual meeting in a paper on "A Plastic Mortar Compression Test for Cement," by E. M. Brickett, with the special cement-sand mixture that he has used in testing cement, has outlined and is ready to conduct a cooperative series of tests using this method to see whether a group of laboratories can obtain as satisfactory results as Mr. Brickett obtained in his laboratory. This will not only be conducted by a number of laboratories, but a number of brands of cement will be used and materials local to each laboratory in addition to specially prepared fine aggregate distributed from one laboratory to the cooperating ones.

Feeling, furthermore, that this study will occupy some time, the committee has felt that it would be desirable to establish at the Bureau of Standards a laboratory where the apparatus used in cement testing could be calibrated, and where further instructions could be given to cement laboratory operators. The services would also possibly be extended to calibration of equipment in laboratories around the country, together with instructions given at the laboratories. The committee has been able to secure so far \$12,500 for operating the laboratory. Efforts are being made, however, to have this sum supplemented by an equal sum appropriated by Congress.

Results of an investigation extending over 15 years were presented in a paper by Alfred H. White on "Volume Changes of Portland Cement as Affected by Chemical Composition and Aging." This investigation covered a number of brands of normal cements and also a number of abnormal cements and showed the effect of high magnesia on volume changes.

Because of improvements which were developed in the method for determining the plasticity of hydrated lime as described in the Society's Standard Specifications for Hydrated Lime for Structural Purposes, Committee C-7 on Lime recommended certain revisions to reduce errors in plasticity measurements caused by relatively slight differences in the method of preparing the putty, by differences in absorption of different lots of base plates, by different methods of cleaning and care of base plates and to provide a standard method for measuring the absorption of base plates.

During the past year considerable interest has been manifested by the various organizations looking toward the establishment of plastering specifications which would demand national recognition of all interested parties including producers, consumers, groups producing materials to which plasters will be applied, groups responsible for the execution of the work and groups representing financial institutions. The committee has given serious thought to methods whereby such cooperation might be effected.

Committee C-11 on Gypsum is likewise interested in plastering specifications and is considering the proposals made for cooperative action in their preparation. This committee has continued its work on the utilization of anhydrite as a

retarder for portland cement and the Non-Metallic Minerals Section of the U. S. Bureau of Mines has generously cooperated in this work.

The Bureau of Standards has cooperated with the committee in a series of tests to determine the crushing strength and modulus of elasticity of gypsum fiber concrete. Two kinds of gypsum were employed, a high-consistency stucco and a low-consistency stucco. The results of the tests are now being prepared for publication.

The committee is investigating the advisability of substituting a modified Vicat apparatus for the Southard viscosimeter to determine the normal consistency of calcined gypsum. Revised specifications for Keene's cement and new specifications for gypsum dental plasters were submitted during the year.

Concrete and Concrete Aggregates

The property of concrete receiving the greatest attention during the year has been durability. Several papers presented at the annual meeting emphasized the importance of considering properties other than strength alone, notably a paper by C. H. Scholer on "Some Accelerated Freezing and Thawing Tests on Concrete," and a paper by Ira L. Collier on "Permeability of Concrete."

The general subject of concrete testing also received considerable attention. In view of the present tendency to utilize the flexure test in certain uses of concrete this test is receiving further study. Two papers dealt with the subject at the 1928 annual meeting as follows: "The Effect of Several Mechanical Features of Testing on the Determination of the Flexural Strength of Plain Concrete," by T. F. Willis and F. N. Wray, and "Compression, Flexure and Tension Tests of Plain Concrete," by H. F. Gonnerman and E. C. Shuman.

Committee C-9 on Concrete and Concrete Aggregates is also studying methods of testing and properties of concrete and a substantial start has been made in the preparation of an extensive bibliography on elasticity of concrete. A number of methods of test were submitted for publication as information, namely, for soundness of coarse aggregate (sodium sulfate soundness test), for percentage of shale in aggregate, for quantity of soft pebbles in gravel, for determination of coal and lignite in sand, and for determination of total amount of moisture in fine aggregate by drying. Proposed specifications for concrete pavements and for pavement base were submitted by Committee D-4 on Road and Paving Materials.

Committee C-9 has a very extensive program now before it, among the more important projects under consideration being the following: Preparation of specifications covering mixing, conveying and placing of concrete; review of data on flexural strength of concrete with a view to determining if present methods of designing concrete mixtures for compressive strength can be applied to flexural strength; standardization of method of making transverse strength tests of concrete; development of apparatus for measuring workability of concrete; correlation of methods of making abrasion tests on stone, slag and gravel; determination of relation of shape of particle of aggregate to the cross-bending and compressive strength of concrete; determination of the suitability of stone and slag sand as a fine aggregate; study of effect of various extraneous materials such as coal, lignite, alkali, shale, etc., on concrete with a view of fixing definite specification limits; studies of curing of concrete; studies of admixtures in concrete; recommendations for apparatus and methods of testing for determination of deformations in concrete; studies of factors affecting the durability of concrete; and the preparation of definitions of terms used in connection with concrete and concrete aggregates.

Drain Tile

Investigations of concrete drain tile subject to alkali soils and waters were continued by Committee C-6 on Drain Tile. The result of a portion of this cooperative investigation

carried out at the U. S. Bureau of Public Roads, University of Minnesota, University Farm, St. Paul, Minn., were presented at the annual meeting in a paper by D. G. Miller on "Resistance of Portland-Cement Concrete to the Action of Sulfate Waters as Influenced by the Cement." The results of other studies have been published in bulletins of the Iowa Engineering Experiment Station. A further laboratory study is being made by the Iowa Engineering Experiment Station using certain chemical admixtures, some of which appear promising in resisting the deleterious effect of alkali soils.

The study of the loads upon pipe in wide trenches has been started at the Iowa Engineering Experiment Station under a cooperative agreement with the Clay Products Association. The first series of studies is just being completed.

The Joint Concrete Culvert Pipe Committee presented a further report in its endeavors to arrive at standard specifications, and specifications were submitted for publication.

A comparison of standard A.S.T.M. required loads on sewer pipe with the fiber stresses calculated from design formulas was presented in a paper by F. B. Lysle on "The A.S.T.M. Specifications for Sewer Pipe and the Fiber Strength of the Material."

Hollow Tile, Brick and Refractories

An extensive investigation on brick was reported on in a paper by J. W. McBurney on "The Effect of Strength of Brick on Compressive Strength of Brick Masonry." Committee C-3 on Brick submitted new specifications for sand-lime brick and revised its specifications for concrete brick, for building brick and for paving brick. These revisions entailed corresponding revisions in the methods of testing.

Committee C-10 on Hollow Masonry Building Units submitted revisions on its hollow burned-clay wall tile, fire-proofing, partition and furring tile, and floor tile. These revisions consisted chiefly of a proposed minimum requirement on the absorption of hollow tile and a reduction in the number of standard types of load-bearing tile. The minimum requirement for absorption is based upon the results of fire tests of hollow tile walls in which it was found that the tile of extremely low absorption showed a greater tendency to spall than tile of higher absorption of similar design and material.

Committee C-8 on Refractories advanced to standard its specifications for clay fire brick for malleable furnaces and annealing ovens, for stationary boiler service and for marine boiler service. A study is being made on the pyrometric cone equivalent value of refractory cements containing sodium silicate.

A paper of interest in refractory studies was presented at this annual meeting by M. L. Hartmann, O. B. Westmont and C. E. Weinland, entitled, "Methods of Measuring the Thermal Conductivity of Insulating and Refractory Materials."

Road Materials

In addition to the proposed specifications for concrete pavements and for pavement base prepared by Committee D-4 on Road and Paving Materials, that committee issued as tentative a recommended practice for bituminous paving plant inspection and a tentative method of abrasion testing of gravel. The committee revised its tentative specifications for high-carbon and for low-carbon tar cement for use cold in repair work and its methods of test for residue of specified penetration, for distillation of bituminous materials suitable for road treatment, and for bituminous emulsions. Its method of decantation test for sand and other fine aggregate was advanced to standard.

The committee is giving attention at this time to the stability of bituminous mixtures and methods of test for distillation, viscosity and flow tests, specifications for road oils, abrasion tests for stone block, specifications for aggregates for bituminous pavements and bases, tests for sub-grade materials, vitrified paving brick, and nomenclature. The

latter is of especial importance and involves in addition to Committee D-4, Committee D-8 on Waterproofing Materials and Committee D-2 on Petroleum Products and Lubricants, the latter committee having submitted a number of definitions of terms relating to petroleum products which were accepted for publication as tentative. Mr. Prevost Hubbard, secretary of Committee D-4, was delegated by the Executive Committee to confer in London with a committee of the British Engineering Standards Association concerning the definitions, and his report is now under consideration by the several committees mentioned.

Waterproofing Materials

Committee D-8 on Bituminous Waterproofing and Roofing Materials has now completed most of its program on the preparation of standard specifications for all types of bituminous waterproofing and roofing materials. One additional test, that for steam distillation of bituminous coatings, was advanced to standard. The only specifications now continued as tentative by the committee, those for acid-resisting asphalt mastics, will probably be recommended for advancement to standard at the next annual meeting. Investigations are now being conducted by the committee on fiber analysis and on specifications for membrane materials. Ductility tests are also receiving consideration in the committee.

Paints, Oils and Naval Stores

The work of Committee D-1 on Preservative Coatings for Structural Materials is increasing with a well-balanced program of development of standards and an endeavor to consistently revise old standards when necessary, as well as the preparation of new standards to meet the requirements of the industry. The investigations of the past few years on anti-fouling paints culminated in the preparation of specifications for toxic ingredients in anti-fouling paints together with the necessary methods of analysis. The specifications for boiled and raw linseed oil have been revised, bringing these specifications in line with those of the Federal Specifications Board. A number of revisions were made in the several methods of analysis under the jurisdiction of the committee and several new methods of test were submitted, such as for alkalinity or acidity of pigments, bleeding of pigments, hygroscopic moisture in pigments, oil absorption of pigments, mass color and tinting strength of pigments, also routine analysis of dry cuprous oxide and dry mercuric oxide. The specifications for pigments published as tentative during the past few years were advanced to standard.

Committee D-17 on Naval Stores has concentrated its attentions on methods of determining what the committee designates, temporarily at least, as the viscosity of rosin. Cooperative tests carried out on four different procedures resulted in the publication as information of a capillary tube method and a ring-and-ball method, the latter a modification of the present methods of the Society for the determination of softening point of bituminous materials.

The committee is planning to give further study to methods for the determination of toluol insoluble matter and ash and water in rosin, and probably to methods for the determination of acidity, saponification number and unsaponifiable matter.

Of outstanding importance in the work of Committee D-2 on Petroleum Products and Lubricants is a report on the significance of tests relating to petroleum products. This is the result of several years' work on the part of a special committee appointed for the purpose of discussing the scope and application of and significant results secured by the various methods of test, including not only tests of the A.S.T.M. but also other tests in use. In line with this report two papers were presented at the annual meeting, one by J. Bennett Hill on "The How and Why of Gasoline Performance," and the second by R. E. Wilson and D. P. Barnard, 4th, on "The Significance of Various Tests Applied to Motor Oils." The annual report of Committee D-2 as usual contains the results of many investigations on various phases of petroleum products testing.

New methods developed include autogenous ignition temperature, distillation of crude petroleum and gravity of petroleum products. Revisions were made in the standard methods of test for water in petroleum products and other bituminous materials, water and sediment in petroleum products by means of centrifuge and steam emulsion of lubricating oils. In addition, revisions were made in a number of tentative methods of test, and methods for the determination of saponification number, cloud and pour points, carbon residue and for the testing of gas oils were advanced to standard. The definitions of terms relating to petroleum products submitted as tentative have already been mentioned. The committee, functioning as a sectional committee under the procedure of the American Standards Association, has reviewed many of its methods for adoption by the American Standards Association and 13 methods have now been approved by the Association as American Standard and 3 methods as American Tentative Standard.

The committee has under way the development of methods for determining oil in wax and the dilution of crankcase oil and is working on revisions of the tentative methods for determining the color of petroleum products, the precipitation number of lubricating oils and the determination of sulfur in naphthas and illuminating oils.

In connection with the methods of sampling and analysis of creosote oil Committee D-7 on Timber is preparing a table of correction factors for density and volume of creosote oil to correct from observed temperatures to standard temperature. It is expected that this table will be recommended for publication at the next annual meeting.

Insulating Materials

Committee D-9 on Electrical Insulating Materials has submitted further revisions of the standard methods of testing molded insulating materials, making definite recommendations relative to a new tension test specimen and revisions in the method of impact testing. Plasticity of hot molded materials is also receiving consideration. New tentative methods of testing insulating varnishes were prepared. In addition to the tests now included, the acid and alkali proof test will receive consideration during the coming year.

Several improvements in the tentative methods of testing sheet insulating materials have been proposed and new tentative methods of testing varnished cloth tape have been prepared. The committee is now considering the development of materials specifications.

In respect to liquid insulation, the committee has given consideration to neutralization number, life tests, short-time sludge tests and stability tests for cable compounds. These will receive further study during the year with particular reference to developing a short-time sludge test. The studies of the committee on porcelain insulation led to the development of a method of test for impact which test was also found applicable to the testing of molded materials. Radio frequency tests continue to receive considerable attention.

A new sub-committee on methods of measurement of resistivity and power factor has been organized during the year and has before it a rather comprehensive program. Up to the present time the work has been devoted to a review of various definitions of resistivity, power factor and dielectric constant and the committee will be interested in reviewing methods now in use and will attempt to harmonize the differences that may be found between them.

The paper by M. L. Hartmann, O. B. Westmont and C. E. Weinland on "Methods of Measuring the Thermal Conductivity of Insulating and Refractory Materials" has already been mentioned in reference to refractory materials.

Coal and Coke

Committee D-5 on Coal and Coke submitted the following tentative methods: methods of test for cubic foot weight of coke; for cubic foot weight of crushed bituminous coal, for sieve analysis of coke, and a method of tumbler test for coke.

The tumbler test was prepared jointly by Committee D-5 and the Committee on Standardization of Coke Testing Methods of the Eastern States Coke Oven and Blast Furnace Association. The committee also revised the method of determination of phosphorus in coal and coke now appearing in the standard methods of laboratory sampling and analysis of coal and coke.

Since the annual meeting the committee submitted a method of test for sieve analysis of crushed bituminous coal and a method of test for size of anthracite coal. These were published and circularized preparatory to their submission with the 1929 annual report of the committee. The committee has also agreed upon a change in the Eschka method for determination of sulfur in coal and coke which would change the present temperature of 870-925° C. to 800° C. $\pm 25^\circ$ C.

Experiments have been conducted as to methods of test for determination of pulverization characteristics of various coals in connection with commercial pulverization of coal for burning as powdered coal. A sub-committee on tolerances has conducted several large-scale sampling experiments to get data as to allowable tolerances when different samplers independently collect gross samples representing the same shipment of coal. A sub-committee on foundry coke specifications is being organized to consider revising the present standard foundry coke specifications, especially the feasibility of incorporating in the specifications physical characteristics of cokes that influence their performance in the cupola.

The Sectional Committee on Classification of Coal, organized in 1927, has made considerable progress in studying the problems before it. Three technical committees have been organized, one on scientific classification of coal, a second on use classification of coal and one on marketing practice. A preliminary report has been prepared by the technical committee on scientific classification on the nature, location and mode of occurrence of types of American coals. The origin and composition of coal and methods for their determination are also being studied. This survey has shown the need for additional data and test methods in regard to air-slaking to distinguish between slaking and non-slaking coals. The committee will also give attention to hardness, toughness or friability, and to burning quality as being important characteristics of certain classes of coal.

Timber and Shipping Containers

Subsequent to the submission of its very comprehensive specifications for structural wood joist, planks, beams, stringers and posts, Committee D-7 on Timber found no need for the submission of new specifications or the recommendation of changes during the past year, but it is now giving consideration to some revisions of these specifications which may be included with the 1929 annual report of the committee. Its method of test for distillation of creosote oil was advanced to standard at the last annual meeting. As mentioned previously, the committee is now at work on the preparation of tables of correction factors for density and volume of creosote oil when tested at other than standard temperature and an extensive report on this subject was included with the last annual report of the committee. The committee is now engaged in the preparation of a number of definitions of terms relating to timber and the revision of the present standard definitions.

Fire tests of lumber are receiving the attention of Committee C-5 on Fire Tests of Materials and Construction and investigations are being carried out under the auspices of this committee at the Forest Products Laboratory.

Members of Committee D-10 on Shipping Containers have cooperated very closely during the past few years with the container committee of the Federal Specifications Board in the preparation of specifications for various types of containers. These specifications have been prepared to meet Government requirements and are based very largely upon the present A.S.T.M. specifications.

The committee has endeavored to stimulate research in various organizations. It is expected that ultimately the committee will review much of the information now being collected by various commercial laboratories, the Freight Container Bureau and Freight Claim Bureau of the American Railway Association and various Government agencies such as the Transportation Division of the Bureau of Foreign and Domestic Commerce and the Forest Products Laboratory of the Department of Agriculture.

Slate and Building Stone

The activities of Committee D-16 on Slate during the past year have consisted mainly in the continuation of investigational work already in hand by the several sub-committees and the creation of a new sub-committee on utilization and installation. No recommendations for changes in existing methods of test were recommended by the committee.

The committee has continued its practice of holding its meeting in conjunction with the meetings of other organizations having a direct bearing on the work of the committee. The spring meeting of the committee, for example, was held in conjunction with the Lehigh Valley Mineral Industries Conference participated in by many professional and technical organizations. The next meeting of the committee will be held in conjunction with the annual convention of the National Slate Association. These meetings make possible the presentation of a number of papers and discussions.

An interesting paper was presented at the last annual meeting by D. W. Kessler on "The Development of an Apparatus for Wear Tests on Flooring Materials," which included a discussion of the general characteristics of marble and other building stones. A further paper on the subject of building stones was that by Lee Huber on "Staining and Efflorescence on Indiana Limestone Caused by Moisture Seepage Through Backing Masonry Materials."

Committee D-18 on Natural Building Stones has made considerable progress on its program during the year. The compilation of data has been completed and is now receiving the study of the committee. Proposed methods of physical testing for building stone have been prepared in preliminary form and after receiving the review of the committee will be submitted with its next annual report. Two new sub-committees, one on uniform cubing of stone and the other on finishes, are actively at work.

Rubber and Textiles

The work of Committee D-11 on Rubber Products within the past year has been largely of an investigative nature. Revisions have been made in the tentative specifications for insulated wire and cable: 30-per-cent Hevea rubber in accordance with the recommendations of the Sectional Committee on Insulated Wires and Cables for Other than Telephone and Telegraph Use and revisions were also made in the tentative specifications for rubber insulating tape and the standard specifications for adhesive tape and new methods of chemical analysis of rubber products were submitted. Consideration is being given to the revision of other specifications such as the standard specifications for mechanical rubber hose and specifications for belting.

The committee has been carrying out a number of laboratory and service tests on the abrasion of rubber products. In this connection a paper was presented at the annual meeting by H. A. Depew on "An Explanation of Some of the Difficulties in Abrasion Testing of Rubber." Life and aging tests for rubber products are also receiving the attention of the committee. Various compounds are being investigated when subjected to several types of treatment.

Of outstanding importance is the work of the committee on rubber products for absorbing vibration. In this work the committee has cooperated with the Society of Automotive Engineers in the development of specifications and methods of testing rubber products used in automobile construction

such as engine supports, bumpers, spring shackles, torque insulators and universal-joints for the absorption of vibration and shock. This work involves the consideration of hardness tests and permanent set tests.

Committee D-11 approved the proposed specifications for rubber-lined fire hose for public and private fire department use prepared by the Sectional Committee on Specifications for Rubber-Lined Fire Hose. It accordingly took action to withdraw its own standard specifications for fire hose. The recommendations of the Sectional Committee are the result of several years' work to arrive at uniform and generally acceptable specifications.

Methods of Testing and Nomenclature

In addition to the papers already mentioned as having been presented before the Society covering various phases of testing, a number of other papers presented at the last annual meeting dealt with various phases of testing as follows: "The Calibration of Extensometers," by R. L. Templin; "Determination of Correct Load Application in Rockwell Hardness Testing Machines," by F. S. Mapes; "Measurement of Brittleness," by P. L. Irwin; "Studies of Methods of Making Deval Abrasion Tests of Aggregates," by Stanton Walker; "Methods of Particle Size Determination," and "Sampling of Pulverized Coal from Air Streams," by Lincoln T. Work; "The Test for Volatile Combustible Matter as Applied to Coal-Tar Pitch," by S. R. Church and W. H. Fulweiler; "The Wearing Qualities of Tire Chains," by W. H. Parker; "Wear and Mechanical Tests of Some Railroad Bearing Bronzes," by H. J. French; "Wearing Tests of Twelve-per-cent Manganese Steel," by J. H. Hall; "Wear Testing of Various Types of Steels," by J. M. Blake.

Committee E-1 on Methods of Testing in addition to its function as a correlating committee sponsored several investigations on the study of materials testing from a fundamental viewpoint, resulting in interesting reports from its technical committee on plasticity, consistency, etc., its section on sub-sieve sizes and its section on coarse screens.

A number of new definitions of terms were submitted during the year including additions to the definitions of terms relating to heat treatment, prepared by the joint committee organized to formulate such definitions and reported through Committee A-4 on Heat Treatment of Iron and Steel, definitions of terms relating to petroleum products and definitions of terms relating to magnetic testing. A number of definitions were reviewed by Committee E-8 on Nomenclature and Definitions during the year and were recommended for advancement to standard by the standing committees concerned. The volume and importance of the definitions of the Society have reached a point where a glossary is essential and such a glossary was accordingly prepared and circularized in preliminary form preparatory to its final publication.

International Association for Testing Materials

As a result of the International Congress for Testing Materials held at Amsterdam in 1927, in which the Society participated, the New International Society for Testing Materials has been organized. The Association plans to hold a further Congress in 1931 and the program is now being developed through securing a number of preliminary reports on various subjects. Papers and reports will then be solicited for presentation at the Congress. Many members of the Society are now affiliated with the International Association.

Future Work

From the foregoing statements on work in progress or contemplated, it will be appreciated that the Society has many active years before it. The progress made during the past year in placing the work on a stronger basis will contribute immeasurably toward insuring that these future years will see the fulfilment of the many projects now under way, and attacking effectively the problems constantly being brought to it.

New Members to January 23, 1929

The following 53 members were elected from December 1, 1928, to January 23, 1929, making the total membership, exclusive of student members, 4236:

Company Members (8)

Baker and Co., Inc., F. E. Carter.
Byrnes Shellac Co., Inc., James W., W. J. McIntosh.
Gallenkamp and Co., Ltd., A., E. A. Pearce.
Gray Iron Institute, A. J. Tuscany.
Mexican National Commission of Irrigation Laboratories, F. A. Salida (previously incorrectly listed as National Commission of Irrigation Laboratory).
Non-Ferrous Ing't. Metal Institute, R. D. T. Hollowell.
Philadelphia Rapid Transit Co., W. R. Scanlin.
Rochester & Pittsburgh Coal Co., G. C. Squier.
White & Bagley Co., The, G. H. Ryan.

Individual and Other Members (41)

Anderegg, F. O. (Mellon Inst. of Industrial Research).
Angus, James (William Angus, Inc.).
Appel, W. D. (U. S. Bureau of Standards).
Baird, K. E. (Philadelphia Coke Co.).
Bissell, C. T. (Nat. Board of Fire Underwriters).
Branson, E. H. (General Railway Signal Co.).
Canada National Research Council, F. E. Lathe.
Chamberlain, T. H. (New Haven Clock Co.).
Conrad, T. J. (Fairbanks, Morse and Co.).
Davis, C. H. (Am. Brass Co.).
Dayton, Ohio, Public Library.
Dickinson, E. A. (Container Testing Labs., Inc.).
Dillman, D. W. (Civil Engr.).
Flynn, O. R. (Waldrich Bleachery).
Fox, W. A. (Fox & MacKenzie).
Gilmore, G. K. (Pittsburgh Testing Lab.).
Green, J. O. (Standard Oil Co. of N. J.).
Holmgren, W. L. (W. H. Barber Co.).
Horton, W. C. (British Embassy).
Lee, H. R. (Cia. Cubana de Electricidad).
Legge, E. E. (Am. Steel and Wire Co.).
Lindsay, G. L. (Universal Portland Cement Co.).
Lockeman, G. F. (Procter & Gamble Co.).
Lucas, E. A. (Molybdenum Corp. of America).
McCown, W. V. (Am. Vibroolithic Corp.).
Petts, G. E. (Baltimore Brick Co.).
Raber, C. T. (Pennsylvania Dept. of Highways).
Raphael, A. L. (Standard Oil Co. of N. J.).
Rose, C. H. (Nat. Lead Co. of Calif.).
Smith, A. W. (Univ. of Michigan).
Stevens, R. H. (Bogalusa Paper Co., Inc.).
Stevenson, Lillian (Univ. of Chicago).
Stone, F. L. (Universal Portland Cement Co.).
Thornburg, Max (Standard Oil Co. of Calif.).
Tindale, Edward (Main Roads Board, Perth, Western Australia).
Tracy, J. M. (Board of Education, Rochester, N. Y.).
Ward, M. L. (Univ. of Michigan).
Watson, R. H. (Semet-Solvay Co.).
Williams, R. C. (Williams Lab., Inc.).
Wilson, A. R. (The Pennsylvania Railroad Co.).
Wilson, E. P. B. (Municipal Council, Shanghai, China).

Junior Members (4)

Blackwood, R. R. (Univ. of Melbourne).
Bristow, John (Duff-Norton Mfg. Co.).
Moore, Stanley (The Dura Co.).
Schroeder, C. W.

Deceased Members and Representatives

We announce with regret the death of six members and representatives:

W. A. BROWNFIELD, Chief Engineer, Kentucky Rock Asphalt Co., 712 Marion E. Taylor Building, Louisville, Ky. Member since 1925.
DONALD C. DAVIS, Mechanical Engineer, The Gould Coupler Co., Depew, N. Y.
EDOUARD L. FOUCAR, President, Foucar, Ray & Simon, Inc., 815 Buena Vista Ave., San Francisco, Calif. Member since 1912.
JESSE L. JONES, Chief Chemist, Material and Process Division, Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa. Member since 1909.
G. H. LYONS, Manager, Pittsburgh Testing Laboratory, 1713 Sansom St., Philadelphia, Pa. Member since 1923.
GEORGE W. NIEDRINGHAUS, Chairman of the Board, Granite City Steel Co., Granite City, Ill.

PROFESSIONAL CARDS



Ekroth Laboratories Inc.
SINCE 1889
TECHNICAL RESEARCHES
INDUSTRIAL PROBLEMS
ANALYSES TESTS
CERTIFICATIONS
461 8th Ave., New York
Member Association of Consulting Chemists and Chemical Engineers

A. W. Williams Inspection Company

Timber and Creosoting Inspection Service
Analysis of Wood Preservatives
MOBILE, ALABAMA

Inspectors for Assignments at all Plants

Metallographists Chemists

New York Testing Laboratories

50 WASHINGTON STREET, NEW YORK CITY
Consulting and Research Engineers
Mechanical, Physical and Electrical Tests Inspections

The Continental Inspection

E. PAVOT (1909)

16 Rue Sabatier,
Charleroi, BELGIUM

Inspection, Testing and Analysis
of Steel Materials
THROUGHOUT THE CONTINENT

R. H. LAVERIE & SONS, INC.

Inspection and Testing Engineers

17 STATE STREET, NEW YORK CITY
Offices in Principal Cities

Inspection of
Rails, Rolling Stock and Track Material,
Power Plant and Industrial Equipment,
Steel for Buildings, Bridges, etc.

WEISS AND DOWNS, Inc.

CHEMICAL ENGINEERS

SPECIALISTS IN

BITUMINOUS MATERIALS

J. M. WEISS, MEMBER, A. S. T. M.

50 E. 41st Street, New York City

Member Association of Consulting Chemists and Chemical Engineers

ELECTRICAL PHOTOMETRIC

MECHANICAL CHEMICAL

TESTING

ELECTRICAL TESTING LABORATORIES
80th St. and East End Ave.
New York

SOUTHWESTERN LABORATORIES

Consulting, Analytical Chemists and
Chemical Engineers
Inspections, Testing and Chemical Work
Fort Worth, Dallas, Houston, Amarillo
and
San Antonio, Texas

Le "Controle Technique"

INSPECTION
and TESTING OF MATERIALS
Offices in Every Metallurgical Center in Europe
Telegrams: "Controloms"
PARIS, 12 RUE DE MIROMESNIL

Robert W. Hunt Company, Engineers
Inspection, Tests and Consultation

GENERAL OFFICES
2200 INSURANCE EXCHANGE, CHICAGO
CHEMICAL & PHYSICAL LABORATORIES
SPECIAL TESTS & INVESTIGATIONS
INQUIRIES INVITED AT
Chicago, New York, Pittsburgh,
Montreal, St. Louis, San Francisco

MORGAN T. JONES COMPANY, Inc.

Inspection, Tests and Consultation

General Offices
228 N. La Salle St., Chicago, Ill.
Physical and Cement Laboratories. Inspection of rails and rail fastenings. Structural Steel for Bridges and Buildings, etc.
Mr. Jones' twenty-fifth year in business.

Cable Address—Finresslab **FINISHING RESEARCH**

Laboratories, Inc., Chicago
1167 West 22nd St., Chicago, Illinois
Publishers — Testing Engineers
Comparative and other tests on paints,
varnishes, japsans, enamels and lacquers.
Spraying machines, baking ovens, Weathering
and Fading Machines in continuous
operation.

Inspection and Testing
of
Paving, Buildings and
Engineering Materials
Fuels, Oils and Metals
Standard Equipment
Monroe L. Patzig
Consulting Engineer
210 11th St., Des Moines, Ia.

LUCIUS PITKIN, INC.

Analysts—Assayers—Weighers—Samplers
Non-Ferrous, Precious Metals
Ores—Metals—Scrap
SHIPPER'S REPRESENTATIVES
PITKIN BUILDING
47 FULTON ST. NEW YORK CITY
Member Association of Consulting Chemists and Chemical Engineers

ABBOT A. HANKS, Inc.

Engineers and Chemists
Consulting, Inspecting, Testing
Physical and Chemical Laboratories
624 Sacramento Street
SAN FRANCISCO, CALIF.

Ledoux & Company, Inc.

Chemists, Assayers, Engineers

Samplers and Weighers

99 JOHN STREET

NEW YORK, N. Y.

The Detroit Testing Laboratory

ESTABLISHED 1903
Inspection
Chemical and Physical Testing
Consultation and Research
Special Reports
554 BAGLEY AVE. DETROIT, MICH.

PROFESSIONAL CARDS will be accepted for inclusion on this page from Consulting Engineers, Metallurgists, Chemists, Testing Engineers and Testing Laboratories.



Promote Customer Confidence With a P.T.L. Certificate of Inspection

Have your product tested and analyzed by the Pittsburgh Testing Laboratory and send your customers the certificate. It's the most convincing evidence in the world of the superior quality of your product.

The P.T.L. has a national reputation for dependable laboratory analysis built up by 45 years of service.

Let us explain how we can serve you.

PITTSBURGH TESTING LABORATORY

PITTSBURGH

PENNSYLVANIA

Branch Offices in Principal Cities

UNITED STATES TESTING COMPANY, INC.

316 HUDSON STREET - NEW YORK CITY

ANALYSES OF

TEXTILE FIBERS
YARNS
FABRICS

SOAPs
OILS
WATER

DYES
PAPER
WOOD PULP

FUEL OILS
COAL
COKE

General Chemical Analyses

Textile Consulting

HOBOKEN

CHICAGO

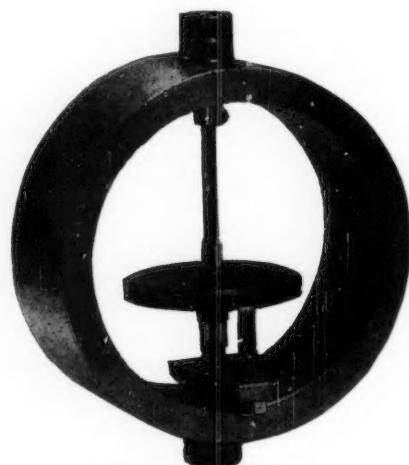
PHILADELPHIA

NEW BEDFORD

PATERSON

SHANGHAI

BRANCHES:



PROVING INSTRUMENTS FOR
CHECKING UNIVERSAL AND HARDNESS
TESTING MACHINES

REFERENCE STANDARDS

CALIBRATED AND CERTIFIED BY THE
BUREAU OF STANDARDS

WHITTEMORE-PETRENKO BASIC PAT. 1648375

Morehouse Machine Co.
YORK - PA.

Froehling & Robertson, Inc.

RICHMOND — ATLANTA

ESTABLISHED 1881

INSPECTIONS—TESTS

CHEMICAL ANALYSES—CONSULTATION

A corps of carefully trained inspectors in our exclusive employ. Inspection of Highway and Structural Materials at point of manufacture.

All operations conducted in strict accordance with A. S. T. M. Specifications unless otherwise specified.

CORRESPONDENCE INVITED

There Is Now Available for Distribution

A NEW 12-PAGE TECHNICAL BOOKLET

Fully Illustrated, Covering Measuring Equipment for Stress, Strain, Pressure, Load, Impact, Vibration, Torque, Acceleration and Repeated Stress.

The following equipment is discussed in this booklet:

The McCollum-Peters Electric Telemeter
The Whittemore Strain Gage
The Huggenberger Tensometer

Other Bulletins of recent issue now available are:

THE BEGGS DEFORMETER describing the solution of indeterminate structures by the use of elastic models.
THE SOUTHWARK-EMERY testing machines of the new **UNIVERSAL RECORDING TYPE**.



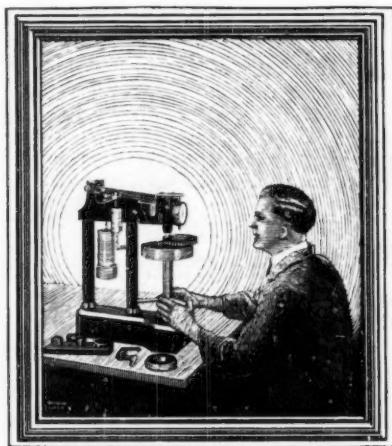
SOUTHWARK FOUNDRY AND MACHINE CO.

400 WASHINGTON AVENUE

PHILADELPHIA, PA.

STEEL CITY TESTING LABORATORY

5444 14TH AVENUE, DETROIT, MICH.



The ROCKWELL HARDNESS TESTER

In the tool room and the engineering laboratory they depend upon the ROCKWELL as well as in the production inspection department.

WILSON-MAEULEN CO

INCORPORATED
383 CONCORD AVENUE, NEW YORK

Laboratory Apparatus

As Per A.S.T.M. Standards

In Stock or Made to Order in Our Glass Blowing Department and Machine Shop

Also a Complete Line of Biological, Chemical and Metallurgical Laboratory Apparatus, Chemicals, Drugs, Stains and Minerals

WRITE, SPECIFYING YOUR REQUIREMENTS

EIMER & AMEND

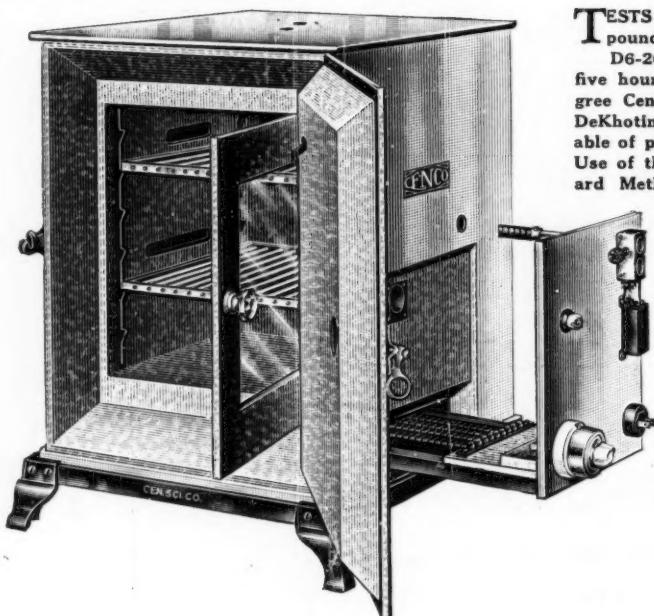
EST. 1851

INC. 1897

Headquarters for Laboratory Apparatus and Chemical Reagents

Third Ave., 18th to 19th St.
New York, N. Y.

UNIFORMITY of TEMPERATURE of SAMPLES $\pm 0.5^\circ$ C.



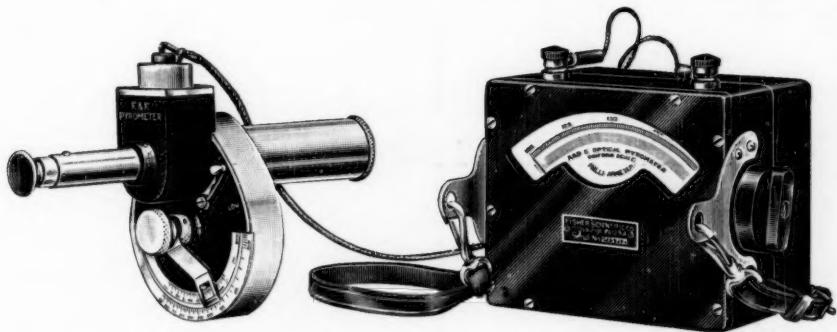
TESTS for loss on heating of asphaltic compounds by A. S. T. M. standard. Method D6-20 requires a uniform temperature for five hours within a variable range of one degree Centigrade. The space uniformity of the DeKhotinsky triple wall oven is within a variable of plus or minus three degrees Centigrade. Use of the auxiliary rotating shelf (see Standard Method referred to above) reduces the temperature changes of the sample to variation no greater than one-half of one degree Centigrade. No other drying oven on the market approaches this performance.



THE Cenco DeKhotinsky Oven shown is No. 9830B, 14 $\frac{3}{4}$ " X 12" X 11 $\frac{3}{4}$ " inside dimensions, for 110 volts, or No. 9831B same for 220 volts at \$140.00; No. 9830C, 19 $\frac{3}{4}$ " X 17" X 14" inside for 110 volts, or No. 9831C, same for 220 volts at \$220.00. The rotating shelf is supplied under our No. 9832A for 110 volts, 60 cycle AC or DC at \$95.00, or No. 9832B for 220 volts, 60 cycle AC or DC at \$100.00. Complete description of both sent free on request for Reprint 11 TM.

CENTRAL SCIENTIFIC COMPANY
LABORATORY **CENCO** SUPPLIES
Apparatus **CENCO** Chemicals
460 E. Ohio St. Chicago U.S.A.

Accurate temperature measurements by observation



F. & F. OPTICAL PYROMETER

"ANOTHER FISHER PRODUCT"

APPLICATION

Particularly adapted for:

Research and Laboratory Work
Steel Rolling Mills
Muffle Furnaces
Molten Metals
Heat Treating Furnaces
Forgings

Fuel Beds
Billets
Molten Glass
Ceramic Furnaces
Electrical Furnaces
Coal Ash Fusions

**DIRECT
READING**

**RUGGED
ACCURATENESS**

FEATURES

Accurate and easy to operate.
Does not require contact with the object.
Sensitive but not delicate; sturdy.
Low cost of upkeep.
Temperature Range, 1600° to 4000°C.

Measures temperatures above thermo-couple pyrometers.
Will measure temperatures of moving objects.

**F. & F. Optical Pyrometer
complete . . . \$175.00**

Send for descriptive Booklet

FISHER SCIENTIFIC COMPANY

Laboratory Apparatus and Reagents for Chemistry, Metallurgy, Biology

PITTSBURGH, PENNA.

IN CANADA, FISHER SCIENTIFIC CO. LTD., 472 MCGILL STREET, MONTREAL

TAG-ASTM Standard Pensky-Martens Closed Tester
 TAG-ASTM Conradson Carbon Residue Apparatus
 TAG Saybolt Standard Universal Chromometer
 TAG-ASTM Distillation Apparatus
 TAG-ASTM Union Colorimeter
 TAG-ASTM Closed Tester
 TAG-ASTM Centrifuges
 Etc., Etc.

TAG Saybolt Standard Universal Viscosimeter
 TAG Saybolt Standard Furrol Viscosimeter
 TAG-ASTM Cloud and Pour Test Apparatus
 TAG-ASTM Cleveland Open Tester
 TAG Robinson Colorimeter
 TAG-ASTM Thermometers
 TAG-API Hydrometers
 Etc., Etc.

Standard for All Tests



TAG Oil Testing Instruments have been recognized as standard by the petroleum industry since its inception in this country. Tagliabue was first to incorporate in its instruments the improvements and refinements recommended by the ASTM. This Company has served the industry not only through instruments but through the dissemination of the ASTM ideals.

C. J. Tagliabue Mfg. Co.
 18-88 Thirty-third St.
 BROOKLYN, N. Y.



Scott Testers

Testing Machines for Laboratory and Routine Purposes

POWER TESTERS FOR Cloth, Cordage, Fibers, Insulation, Leather, Metals, Rubber, Silk Tire Cord, Ligatures, Wire, Paper, Rubber Abrasion Machines,

Belt and Tire Flexing Machines, Yarn Scales, Yarn Reels, Twist Counters, Yarn Inspectors, Yarn Swifts, Roving Reels, Hand-Operated Testers.

Henry L. Scott Company

101 BLACKSTONE STREET

PROVIDENCE, R. I.

**Tensile and Compression Testing Machines are not
the only Machines of Superior Design and
Construction which Amsler makes**

Amsler Torsion Testing Machines	Amsler Impact Testing Machines	Amsler Repeated Blow Impact Testing Machines
Each with 4 adjustable sensitiveness ranges. Stress-strain curves of high accuracy to rupture.	Universal types for standard Charpy, Izod and impact-tensile tests. Showing directly the "energy absorbed".	600 blows per minute, in transverse, compression and tension. No rebound errors. Rapid, reliable results.
Amsler Wear Testing Machines	Amsler Spring Testing Machines	Amsler Steel Ball Testing Machines
Adjustable pressure, speeds and slippage. With dynamometer, showing energy absorbed in frictional contact.	With automatic means for producing rapidly repeated stresses between any desired stress limits. All capacities.	12 adjustable sensitiveness ranges for accurate tests of all sizes. Used by the leading producers.
Amsler Cable, Rope, Chain Testing Machines	Amsler Wood Testing Machines	Amsler Trans- mission (Torsion) Dynamometers
Excellent types for both tensile and fatigue tests. Without equal in construction and efficiency.	Universal types for tensile, compression, bending, hardness, and impact tests. The best machines ever designed.	For efficiency tests of turbines, motors, generators, centrifugal pumps, blowers and compressors. Accurate and convenient.

[Whenever you are in the market for testing equipment, let us demonstrate to you the important advantages of the machines which we supply for the particular tests which you desire to perform.]

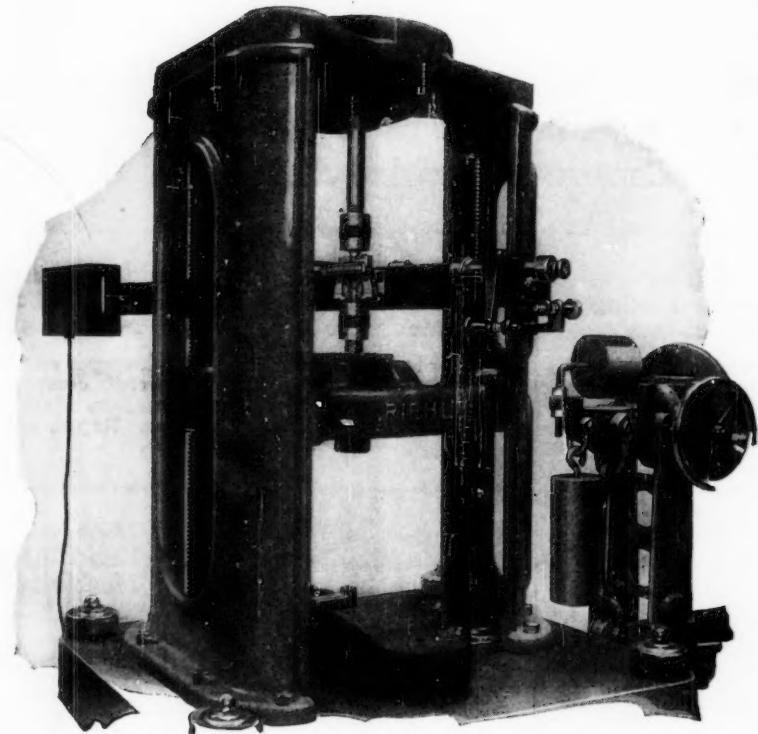
HERMAN A. HOLZ
Testing Engineer

*Complete Line of Machines and Instruments of High Quality
for the Testing of Materials*

17 Madison Avenue, New York, N.Y.

"FOR EVERY TEST—THE BEST"

ANOTHER RIEHLE DEVELOPMENT



Reading to $\frac{1}{100,000}$ of an inch

DURING the past two years we have been developing the mirror extensometer which was first described by Prof. M. F. Sayre at the A.S.T.M. convention held at Atlantic City in June, 1926. This type of extensometer is adaptable to routine testing of tension specimens where a high degree of precision in proportional limit or modulus of elasticity determinations is desired. By use of a system of four reflecting prisms two ends are gained:

(1) Elongations on both sides of the specimen are automatically averaged, and (2) any movement or vibration of the specimen is automatically cared for, so that readings are unaffected.

By use of a "crossed spring" support, it becomes possible to attach the movable mirrors permanently to the main body of the extensometer, eliminating need for the separate Martens lozenges, and so making the extensometer as a whole much simpler to handle.

Readings may be taken directly to 1 part in 100,000 on a 2-in gage length, and by estimation to a fraction of that figure.

RIEHLÉ BROS. TESTING MACHINE CO.

1424 NORTH NINTH ST.

PHILADELPHIA, PA.

ONE TEST IS WORTH A THOUSAND EXPERT OPINIONS

